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ART UNIT	PAPER NUMBER
2141	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/885,223	OFELT ET AL.
	Examiner	Art Unit	
	Kristie Shingles	2141	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2001*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/27/01*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claims 1-52 are pending.

Drawings

1.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 102. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims **1, 2, 4, 5, 7, 8, 10-18, 34-41, 43, 44,** and **47-49** are rejected under 35 U.S.C.

102(e) as being anticipated by Shenoi et al (USPN 6,490,296).

   a.   Per claim 12, Shenoi et al teach a method comprising:

   - receiving a set of data blocks from a plurality of links according to a multi-link protocol (Abstract; a plurality of data cells are transmitted and received according to multi-link protocol and segmentation), and

   - sequencing the data blocks in a first multi-link service card (Abstract, col.9 lines 50-54 and Fig.8; the data cells undergo multi-link segmentation and reassembly via virtual circuits at a location).

   b.   Claims 1 and 7 are substantially similar to claim 12 and are therefore rejected

under the same basis.

   c.   Per claim 2, Shenoi et al teach the method of claim 1, wherein the multi-link

service card is not directly coupled to any of the links (Abstract and col.4 lines 7-11; virtual

circuits are indirectly, but virtually, coupled to the multilink controller).

   d.   Claims 8 and 16 are substantially similar to claim 2 and are therefore rejected

under the same basis.

   e.   Per claim 4, Shenoi et al teach the method of claim 1, further comprising: sending

the data packets from one or more interface cards to the destination device over multiple links

according to the multi-link protocol (Abstract; the data cells are transmitted from the

multicontroller via the virtual circuits according to a multilink protocol for segmentation and reassembly).

      f.   Claims 10 and 17 are substantially similar to claim 4 and are therefore rejected under the same basis.

      g.   Per claim 5, Shenoi et al teach the method of claim 4, further comprising, prior to sending the sequenced data packets to the one or more interface cards: sending the data packets to the multi-link service card for fragmentation (Abstract and col.10 lines 55-61; multilink controller transceiver coupling performs segmentation/fragmentation prior to sequencing/re-sequencing the data at the receiver).

      h.   Claim 11 is substantially similar to claim 5 and is therefore rejected under the same basis.

      i.   Per claim 13, Shenoi et al teach the method of claim 12, wherein the data blocks are fragments, the method further comprising building a packet from the fragments in the first multi-link service card (col.5 lines 43-60; the receiver reassembles the data bit-stream).

      j.   Claim 41 is substantially similar to claim 13 and is therefore rejected under the same basis.

      k.   Per claim 14, Shenoi et al teach the method of claim 13, further comprising fragmenting the packet in the first multi-link service card (col.10 lines 49-61; the transceiver of the multilink controller fragments/segments the data into cells).

      l.   Per claim 15, Shenoi et al teach the method of claim 14, further comprising sending the fragmented packet to a destination device over a computer network (col.9 lines 50-

54 and Fig.8; the segmented data is sent over network via the virtual circuits to a destination device).

m.   Per claim 18, Shenoi et al teach the method of claim 12, further comprising prioritizing the data blocks in the multi-link service card (col.11 lines 38-52; the data cells are prioritized based on a first-in-first-out policy, furthermore the scheduler can prioritize which virtual circuits will be serviced first).

n.   Per claim 34, Shenoi et al teach a multi-link service card comprising:

- an input logic unit that receives data blocks (col.9 lines 50-67; receiver receives the data cells),

- a sequencer unit coupled to the input logic unit for sequencing the data blocks (col.10 lines 61-65; logic at the transmitter is responsible for sequencing and receiver is responsible for re-sequencing), and

- an output logic unit coupled to the sequencer that sends sequenced data blocks (col.10 lines 49-61; logic at the transmitter is responsible for transmitting the sequenced data).

o.   Per claim 35, Shenoi et al teach the multi-link service card of claim 34, further comprising: a memory logic unit coupled to the input logic unit and the output logic unit for storing at least part of the data blocks during sequencing (col.15 lines 1-19; buffer memory is available in both the incoming and outgoing directions).

p.   Per claim 36, Shenoi et al teach the multi-link service card of claim 34, wherein the output unit fragments sequenced data blocks (col.14 lines 31-43; the output unit can either segment or re-segment the sequenced data based on what format the source data comprises).

q.   Per claim 37, Shenoi et al teach the multi-link service card of claim 34, wherein the input logic unit includes an input buffer, an unprocessed buffer and a parser (Figs. 10 and 12; an input buffer, circular buffer and parser are achieved in the system).

r.   Per claim 38, Shenoi et al teach the multi-link service card of claim 34, wherein

the output logic unit includes an output buffer, a processed buffer and fragmenter-assembler

module (Figs.9 and 11; output buffer and memory, circular buffer and segmentation and

reassembly module is achieved in the system).

s.   Per claim 39, Shenoi et al teach the multi-link service card of claim 35, wherein

the memory logic unit includes a memory device, a data memory control, and data state logic

(col.14 lines 51-67; system provides for memory, memory controller and data line logic).

t.   Per claim 40, Shenoi et al teach the multi-link service card of claim 34, wherein

the sequencer unit includes a reorder module (col.16 lines 25-32; the receiver is implicitly

equipped with a reorder module to resolve the out-of-order situations using the sequence

number).

u.   Claim 41 is substantially similar to claim 13 and is therefore rejected under the

same basis.

v.   Claim 43 contains limitations that are substantially equivalent to claims 35 and

39-41, and is therefore rejected under the same basis.

w.   Per claim 44, Shenoi et al teach a method comprising:

- receiving data blocks from multiple links (Abstract and col.10 lines 49-67; the
  multilink system is equipped to receive data from multiple links).

- storing sequence numbers for the data blocks in data queues in the order the data
  blocks were received, the data blocks from each link being stored in a unique
  queue assigned to the respective link (col.7 lines 1-14, col.11 lines 1-53 and
  col.13 line 46-col.14 line 10; sequence numbers are stored in a buffer in the order
  data cells were received, time stamped and catalogued according to the respecting
  virtual circuit or PVC), and

- selecting sequence numbers from each queue in sequence to sequence the data

blocks (col.10 line8-40 and col.11 lines 1-9; the sequence numbers are used for re-ordering the data).

x.   Per claim 47, Shenoi et al teach the method of claim 44, further comprising polling head pointers of the queues for a particular sequence number (col.13 lines 38-50; system allows for checking/reading header information and using pointers for specific sequence numbers).

y.   Per claim 48, Shenoi et al teach the teach the method of claim 47, further comprising polling head pointers of the queues for sequence numbers less that the particular sequence number and declaring an error upon detecting a sequence number less than the particular sequence number (col.9 lines 53-54, col.14 lines 15-30 and col.16 lines 33-40; error is declared when the transmission data is out of sequence due to a missing or discarded data cell).

z.   Per claim 49, Shenoi et al teach the method of claim 44, further comprising moving header information associated with the selected sequence numbers to a processed memory location (col.12 line 61-col.13 line 64; header information along with sequence numbers are stored in processed buffer, either PVC FIFO buffers or the source FIFO buffer).

4.   Claims **50** and **51** are rejected under 35 U.S.C. 102(b) as being anticipated by Maurya (USPN 6,160,808).

a.   Per claim 50, Maurya teaches a method comprising:

- receiving data packets in one or more interface cards (col.14 line 61-col.15 line 11 and Fig.6C; system receives multi-link packets at the adapter interface),

- sending the data packets to a service card for prioritization (col.15 lines 34-56; each data packet is sent to the adapter for prioritization based on their multilink header information and sequence number); and

- sending the prioritized data packets to the interface cards for communication to a destination device over a computer network (col.15 line 49-col.16 line 5; transmitting the prioritized data packets—hierarchically orgranized—to communicate to a destination device).

  b. Per claim 51, Maurya teaches the method of claim 50, further comprising prioritizing the data packets by queuing the data packets according to the header information (col.9 line 56-col.10 line 66, col.12 lines 36-65, Fig.7 and 8 and col.15 lines 16-45; data packets are organized according to the header information and sequence number).

5. Claims **19-26** and **29-33** are rejected under 35 U.S.C. 102(b) as being anticipated by Gai et al (USPN 6,167,445).

  a. Per claim 29, Gai et al teach a router comprising a set of interface cards, wherein the interface cards include an interface card for receiving data blocks from a computer network and an interface card for sequencing the data blocks (col.1 lines 55-64 col.7 line 55-col.9 line 7; routers inherently contain interface cards for receiving data packets and furthermore possess sequencing/reassembly capabilities).

  b. Claims 19 and 32 are substantially similar to claim 29 and are therefore rejected under the same basis.

  c. Per claim 20, Gai et al teach the router of claim 19, wherein the routing control unit includes a packet forwarding engine coupled to the interface card and the multi-link service

card (col.8 line 58-col.9 line 3; routing system comprises forwarding engine coupled to the network interface card and multi-link services).

d.   Per claim 21, Gai et al teach the router of claim 20, wherein the routing control unit includes an interface card concentrator that couples the interface card and the multi-link service card to the packet forwarding engine (col.7 lines 58-65 and col.12 lines 6-40; routing system comprises the router interfaces with forwarding functions and multi-link services according to the multi-link protocol fragmentation).

e.   Per claim 22, Gai et al teach the router of claim 20, wherein the routing control unit includes a routing engine coupled to the packet forwarding engine (col.8 lines 48-65; routing system by virtue incorporates routing and packet forwarding functions).

f.   Per claim 23, Gai et al teach the router of claim 22, wherein the routing engine includes a routing table (col.10 lines 23-35 and col.13 lines 15-45; routing systems implicitly implement routing tables, furthermore the use of the queue table associating queue with the respective/prospective interfaces also achieves function of routing table).

g.   Per claim 24, Gai et al teach the router of claim 19, wherein the data blocks are data packets (col.8 lines 26-47; data blocks can be in forms comprising the various units of transmission, e.g. packets, fragments, segments, datagrams, cells, bits, frames, etc).

h.   Claims 25, 30, 31, and 33 contain limitations that are substantially similar to claim 24 and are therefore rejected under the same basis.

i.   Per claim 26, Gai et al teach the router of claim 19, further comprising a plurality of interface cards (col.8 line 66-col.9 line 3 and col.10 lines 13-35; routing system comprises a plurality of ports and interfaces).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   Claims **3, 9, 27, 28, 45** and **46** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Shenoi et al in view of Gai et al (USPN 6,167,445).

        a.   Per claim 3, Shenoi et al teach the method of claim 1 as applied above, yet fail to

distinctly teach the method of claim 1, wherein the multi-link service card is integrated with one

of the network cards. However, Gai et al teach a routing system comprising a coupling or an

integration between multi-link service and network interfaces (col.7 lines 58-65, col.8 line 66-

col.9 line 3 and col.10 lines 13-35).

        It would have been obvious to one of ordinary skill in the art at the time the

invention was made to allow for an integration of multilink services and a network interface for

the purpose of providing multilink capabilities with less overhead and for the compact advantage

of extending the capability of each by integrating the entities. One skilled in the art would have

been motivated to generate the claimed invention with a reasonable expectation of success.

        b.   Claim 9 is substantially similar to claim 3 and is therefore rejected under the same

basis.

c.   Per claim 27, Gai et al teach the method of claim 19 as applied above, yet fail to distinctly teach the method of claim 19, further comprising a plurality of multi-link service cards. However, Shenoi et al teach that the data cells are transmitted from the multicontroller via the virtual circuits according to a multilink protocol for segmentation and reassembly (Abstract).

It would have obvious to one of ordinary skill in the art at the time the invention was made to provide a plurality of multi-link service cards for the purpose of load-balancing and extending the services of the system. One skilled in the art would have been motivated to generate the claimed invention with a reasonable expectation of success.

d.   Per claim 28, Gai et al teach the method of claim 19 as applied above, yet fail to distinctly teach the method of claim 19, wherein the routing control unit forwards sequenced data blocks to the multi-link service card for fragmentation. However, Shenoi et al teach the transceiver of the multilink controller fragments/segments the data into cells (col.10 lines 49-61).

It would have obvious to one of ordinary skill in the art at the time the invention was made to allow forwarding of the sequenced data to the multilink interface for fragmentation for the purpose of providing fragmentation at an individual interface in communication with the routing system. One skilled in the art would have been motivated to generate the claimed invention with a reasonable expectation of success.

e.   Per claims 45 and 46, Shenoi et al teach the method of claim 44 as applied above, yet fail to distinctly teach the method of claim 44, wherein the data blocks are data packets. However, Gai et al teach that data blocks can be in forms comprising the various units of transmission, e.g. packets, fragments, segments, datagrams, cells, bits, frames, etc (col.8 lines 26-47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to allow for data blocks in the form of data packets for the purpose of transmitting the data in a specified unit. One skilled in the art would have been motivated to generate the claimed invention with a reasonable expectation of success.

8.   Claims **6** and **42** are rejected under 35 U.S.C 103(a) as being unpatentable over Shenoi et al in view of Maurya (USPN 6,160,808).

a.   Per claim 6, Shenoi teaches the method of claim 1 as applied above, yet fails to teach the method of claim 1, further comprising: prioritizing the sequenced data packets to provide quality of service prior to sending the sequenced data packets to the interface cards. However Maurya teaches prioritizing the sequenced data packets according to their sequence numbers prior to transmission (col.15 lines 4-21 and col.17 lines 46-56).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to allow for prioritizing the sequenced data to provide quality of service for the purpose of efficiently organizing a data into its logical sequence. One skilled in the art would have been motivated to generate the claimed invention with a reasonable expectation of success.

b.   Claim 42 is substantially similar to claim 6 and is therefore rejected under the same basis.

9.   Claim **52** is rejected under 35 U.S.C. 103(a) as being unpatentable over Maurya in view of Gai et al (USPN 6,167,445).

Per claim 52, Maurya teaches the method of claim 51 as applied above, yet fails to distinctly teach the method of claim 51, further comprising maintaining multiple queues for a

number of different bundles, wherein header information in the data packets includes

information identifying a bundle and a priority. However, Gai et al teach the maintenance of

multiple queues for corresponding to an interface whereas the packet information classifies and

identities its threshold and priority (col.10 line 12-col.11 line 10 and col.13 lines 1-49).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to allow multiple queues to be maintained for different bundles for the

purpose of categorizing and cataloguing the type and amount of traffic through one interface and

to keep track of the transmission paths of the different bundles. One skilled in the art would

have been motivated to generate the claimed invention with a reasonable expectation of success.

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

a.   Boucher et al (USPN 6,393,487) disclose passing a communication control block
        to a lock device such that a message is processed on the device.

b.   Rao (USPN 6,789,118) discloses a multi-service network switch with policy
        based routing.

c.   Chui [20020165978] discloses a multi-service optical inifiniband router.

d.   Bennett et al (USPN 6,345,302) disclose a system for transmitting and receiving
        data within a reliable communications protocol by concurrently processing
        portions of the protocol suite.

e.   Bhatia et al (USPN 6,118,768) disclose and apparatus and methods for use therein
        for an ISDN LAN modem utilizing browser-based configuration with adaptation
        of network parameters.

       f.   Peirce et al (USPN 6,157,649) disclose a method and system for coordination and control of data streams that terminate at different terminating units using virtual tunneling.

11.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kristie Shingles whose telephone number is 703-605-4244 (or 571-272-3888 after 10/26/04). The examiner can normally be reached on Monday-Friday 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on 703-305-4003. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kristie Shingles
Examiner
Art Unit 2141

kds

LE HIEN LUU
PRIMARY EXAMINER